

Unit: Periodicity

IB Expectations/ Assessment Criteria

DP Group 4: Chemistry, DP - Age 16-18, Objectives

It is the intention of all the Diploma Programme experimental science courses that students achieve the following objectives.

- 1. Demonstrate an understanding of: a. scientific facts and concepts b. scientific methods and techniques c. scientific terminology d. methods of presenting scientific information.
- 2. Apply and use: a. scientific facts and concepts b. scientific methods and techniques c. scientific terminology to communicate effectively d. appropriate methods to present scientific information.
- 3. Construct, analyse and evaluate: a. hypotheses, research questions and predictions b. scientific methods and techniques c. scientific explanations.
- 4. Demonstrate the personal skills of cooperation, perseverance and responsibility appropriate for effective scientific investigation and problem solving.
- 5. Demonstrate the manipulative skills necessary to carry out scientific investigations with precision and safety.

Approach	Significant concept(s) / Considerations
Activity based learning of trends.	Trends in the periodic table.
Guiding Questions	Learner Profile
What are the trends in the modern day periodic table?	<ul style="list-style-type: none">▪ Thinkers▪ Communicators▪ Reflective
Central Idea / Content	Learning Objectives
3.1 The Periodic table 3.2 Physical properties 3.3 Chemical properties 13.1 Trends across period 3 13.2 First row d-block elements	Describe the arrangement of elements in the periodic table in order of increasing atomic number. Distinguish between the terms <i>group</i> and <i>period</i> . Apply the relationship between the electron arrangement of elements and their position in the periodic table up to $Z = 20$. Apply the relationship between the number of electrons in the highest occupied energy level for an element and its position in the

	<p>periodic table.</p> <p>Define the terms <i>first ionization energy</i> and <i>electronegativity</i>.</p> <p>Describe and explain the trends in atomic radii, ionic radii, first ionization energies, electronegativities and melting points for the alkali metals (Li à Cs) and the halogens (FàI).</p> <p>Describe and explain the trends in atomic radii, ionic radii, first ionization energies and electronegativities for elements across period 3.</p> <p>Compare the relative electronegativity values of two or more elements based on their positions in the periodic table.</p> <p>Discuss the similarities and differences in the chemical properties of elements in the same group.</p> <p>Discuss the changes in nature, from ionic to covalent and from basic to acidic, of the oxides across period 3.</p> <p>AHL</p> <p>Explain the physical states (under standard conditions) and electrical conductivity (in the molten state) of the chlorides and oxides of the elements in period 3 in terms of their bonding and structure.</p> <p>Describe the reactions of chlorine and the chlorides referred to in 13.1.1 with water.</p> <p>List the characteristic properties of transition elements.</p> <p>Explain why Sc and Zn are not considered to be transition elements.</p> <p>Explain the existence of variable oxidation number in ions of transition elements.</p> <p>Define the term <i>ligand</i>.</p> <p>Describe and explain the formation of complexes of d-block elements.</p> <p>Explain why some complexes of d-block elements are coloured.</p> <p>State examples of the catalytic action of transition elements and their compounds.</p> <p>Outline the economic significance of catalysts in the Contact and Haber processes.</p>
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<u>Assessment</u>		
Worksheets/Assignments Summative: Other Written Assessment Worksheets to assess students' learning on a daily basis. Quizzes and a unit Test. Summative: Standardized Test Several quizzes and a test will be taken. Labs Summative: Lab Assignment Focussing on DCP.		
Information Literacy & ICT	International Mindedness	TOK
Developing a highly efficient link based periodic table.	Is the periodic table uniform across the world? Why?	The early discovers of the elements allowed chemistry to make great steps with limited apparatus, often derived from the pseudoscience of alchemy. Lavoisier's work with oxygen, which overturned the phlogiston theory of heat, could be discussed as an example of paradigm shift.
Strategies / Activities / Differentiation		Resources
Students with learning difficulty will made a shorter version of coloured periodic table giving the trends. The definitions will be made lighter.		Chemistry Course Companion Teacher assisted learning materials Independent research instruments Worksheets.

Unit Reflections

The unit is incomplete at the end of the semester.